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Vacuum-cleaner nozzle

The invention relates to a vacuum-cleaner nozzle according to the preamble of Claim 1.

Such a vacuum-cleaner nozzle is known from DE-C 30 09 648. In the case of this nozzle, the nozzle part which is arranged in a pivotable manner on the intermediate channel part is completely isolated from the vertical component of the force to which the nozzle is subjected via the handle shaft. The nozzle part is thus positioned slightly obliquely during vacuuming, in accordance with the respective movement direction of the nozzle, to be precise such that the respectively front boundary edge of the suction channel, as seen in relation to the movement direction, is tilted in the direction of the surface which is to be cleaned. During the cleaning of carpets, this edge thus penetrates to a more pronounced extent into the carpet pile, which results in an increase in the pushing force. The oblique positioning of the nozzle part may also easily result in the nozzle part rattling.

The object of the invention is to develop a vacuum-cleaner nozzle of the generic type such that, during cleaning, the nozzle part can be moved in a tilting-free manner over the surface which is to be cleaned.

The set object is achieved by the features specified in the characterizing part of Claim 1. In the case of such a design of the vacuum-cleaner nozzle, on account of the spacing between the pivot axis of the intake connector and the axis of rotation of the supporting roller, the force to which the handle shaft is subjected produces a tilting moment which acts on the intermediate channel part. This tilting moment, in turn, results in a corresponding contact-pressure force of the nozzle part on the surface which is to be

cleaned. As a result of the position of the tilting axis, this contact-pressure force acts essentially on the rear supporting rests of the nozzle part, with the result that forward tilting of the nozzle part is counteracted. This achieves a stable sliding behaviour for the nozzle part on different floor coverings.

The nozzle part is articulated on an extension integrally formed on the underside of the housing of the intermediate channel part. This is the easiest way of achieving the necessary low-level position of the tilting axis.

In order to reduce the pushing force, it is advantageous for two rollers to be provided as supporting rests on each longitudinal side of the nozzle part.

In order to avoid the situation, in the case of floors provided with a uniform joint structure (tiled floors), where all the rollers of the nozzle part penetrate into the joints at the same time, the rollers arranged on one longitudinal side of the nozzle part are axially offset in the longitudinal direction of the nozzle part in relation to the rollers arranged on the other longitudinal side. A vertically adjustable arrangement of the rollers of the nozzle part results in the spacing between the underside of the nozzle part and the surface which is to be cleaned being adjusted automatically in dependence on the negative pressure acting on the nozzle part and the contact-pressure force exerted via the handle shaft.

The task of picking up threads and fluff is improved to a considerable extent in that convex thread-lifting means are arranged on the nozzle part, in front of and behind the suction channel, at an angle of inclination, which slopes up in the direction of the outer

longitudinal sides of the nozzle part, in relation to the bearing plane of the nozzle part.

Since the operating edges bounding the suction channel are continued at the same level in the region of the thread-lifting means, mechanical treatment of the carpet pile which improves the pick-up of dirt also takes place in the region of the thread-lifting means.

An increase in the negative pressure in the suction channel of the nozzle part can be achieved in that arranged behind the rear operating edge of the suction channel is an elastic skirt which extends at least over part of the length of the nozzle part.

The subject matter of the application is described in more detail hereinbelow with reference to an exemplary embodiment illustrated in the drawing, in which:

Figure 1 shows a vacuum-cleaner nozzle in section, and

Figure 2 shows a bottom view of the vacuum-cleaner nozzle.

A vacuum-cleaner nozzle designated 1 has an intermediate channel part 2, a nozzle part 3 and a connector 4. The nozzle part 3 is articulated on an extension 5 such that it can be tilted about a tilting axis 6, said extension being integrally formed at one end of the intermediate channel part 2, on the underside of the housing of the latter. At the other end of the intermediate channel part 2, the connector 4 is connected to the intermediate channel part 2 such that it can be pivoted vertically about a pivot axis 7. At this end of the intermediate channel part 2, furthermore, outwardly projecting bearing journals 8 are integrally formed on the side walls of the latter, a supporting roller 9 of barrel-like design being mounted in a rotatable manner in each case on said

journals. The centre axis of the bearing journals 8 thus forms the axis of rotation 10 for the supporting rollers 9. The supporting rollers 9 are secured axially on the bearing journals 8 by a latching connection 11. In the region of their largest diameter, the supporting rollers 9 are provided with a soft coating 12.

The nozzle part 3 has a suction channel 13, which widens continuously, starting from the transverse sides 14 of the nozzle part 3, in the direction of the transverse centre axis 15 of the latter. A suction connector 16 which is provided on the nozzle part 3, and is designed in arcuate form corresponding to the tilting radius of the nozzle part 3, engages in one end 17 of the intermediate channel part 2, this end being of likewise correspondingly arcuate design. The suction channel 13 may thus be brought into suction connection with the vacuum cleaner via its suction connector 16, the intermediate channel part 2, the connectors 4 and a suction line which can be plugged onto the latter.

Four rollers 18 and 19 are arranged in a rotatable manner in the corner regions of the nozzle part 3. In this case, the rollers 18 arranged on one longitudinal side of the suction channel 13 are offset uniformly in the direction of the longitudinal centre axis 20 of the nozzle part 3 in relation to the rollers 19 arranged on the other longitudinal side. The rollers 18 and 19 support the nozzle part 3 on the surface which is to be vacuumed, with the result that the front and rear operating edges 21 and 22, which bound the suction channel 13, are located at a small distance 23 above the surface which is to be vacuumed. If the rollers 18 and 19 are arranged in a vertically adjustable manner in the nozzle part 3, then it is possible, in the case of a corresponding negative pressure acting on the nozzle part 3, for said rollers to be moved upwards to the extent where the operating edges 21 and 22 rest on the surface which is to be vacuumed. Since the negative

pressure at the nozzle part 3 is considerably higher when vacuuming carpets than when vacuuming smooth floors, the operating edges 21 and 22, during the cleaning of the carpet, thus automatically engage in the carpet pile.

Thread-lifting means 24 and 25 are arranged in the central region of the nozzle part 3, on both sides of the suction channel 13 of the latter. As can be gathered from Figure 1, at least the front thread-lifting means 24 is convex and arranged such that it slopes up obliquely in the outward direction on the nozzle 3. In order to increase the negative pressure acting on the nozzle part 3, in each case one elastic skirt 26 is arranged behind the rear operating edge 22 on both sides of the rear thread-lifting means 25, said skirt trailing, by way of its free end, on the surface which is to be vacuumed, and thus sealing the space beneath the nozzle part 3 in the direction of the rear sides of the latter.

As the sectional illustration according to Figure 1 shows, the tilting axis 6 of the nozzle part 3 is located vertically beneath the axis of rotation 10 of the supporting rollers 9 and, furthermore, is arranged horizontally in front of the rollers 19, which form the rear supporting rests, in the direction of the longitudinal centre axis 20. The position of the tilting axis 6 here is selected such that the continuation 28 of the connecting line 27 between the pivot axis 7 and the tilting axis 6 intersects the bearing plane 29 of the nozzle part 3 in the region between the longitudinal centre axis 20 and the bearing point 30 of the rear rollers 19. As a result of the spacing 31 between the pivot axis 7 and the axis of rotation 10, the horizontal component of the pushing force to which the vacuum-cleaner nozzle 1 is subjected subjects the intermediate channel part 2 to a tilting moment. This tilting moment produces a vertically

directed force on the nozzle part 3, this force being introduced into the nozzle part 3 via the tilting axis 6 and pressing said nozzle part against the surface which is to be cleaned. The abovedescribed position of the tilting axis 6 achieves a balance in the various forces acting on the nozzle part 3, with the result that stable sliding behaviour of the nozzle is ensured.

Claims

1. Vacuum-cleaner nozzle in the case of which a nozzle part (3), which has supporting rests (18, 19) in front of and behind its suction channel (13), is articulated in a tiltable manner on an intermediate channel part (2), in the region of one end of the latter, the tilting axis (6) being located in the region between the support rests (18, 19), and in the case of which nozzle, furthermore, a connector (4) for a suction line is arranged in a vertically pivotable manner on the intermediate channel part (2), in the region of the other end of the latter, and at least one supporting roller (9) is mounted in a rotatable manner on the housing of the intermediate channel part (2), characterized in that the pivot axis (7) of the connector (4) on the intermediate channel part (2) is located vertically above the axis of rotation (10) of the supporting roller (9), and in that the tilting axis (6) of the nozzle part (3) is arranged vertically beneath the axis of rotation (10) of the supporting roller (9), and horizontally in front of the rear supporting rest (19), in the direction of the centre (20) of the front and rear support rests (18 and 19), such that the continuation (28) of the connecting line (27) between the pivot axis (7) of the connector (4) and the tilting axis (6) of the nozzle part (3) intersects the bearing plane (29) of the nozzle part (3) in the region between the centre (20) of the front and rear supporting rests (18 and 19) and the bearing point (30) of the rear supporting rests (19).

2. Vacuum-cleaner nozzle according to Claim 1, characterized in that the nozzle part (3) is articulated in a tiltable manner on an extension

(5) integrally formed on the underside of the housing of the intermediate channel part (2).

3. Vacuum-cleaner nozzle according to Claim 1 or 2, characterized in that two rollers (18 and 19) are provided as supporting rests on each longitudinal side of the nozzle part (3).

4. Vacuum-cleaner nozzle according to Claim 3, characterized in that the rollers (18) arranged on one longitudinal side of the nozzle part (3) are offset in the direction of the longitudinal centre axis (20) of the nozzle part (3) in relation to the rollers (19) arranged on the other longitudinal side.

5. Vacuum-cleaner nozzle according to Claim 3 or 4, characterized in that the rollers (18 and 19) are arranged in a vertically adjustable manner in the nozzle part (3).

6. Vacuum-cleaner nozzle according to one or more of the preceding claims, characterized in that convex thread-lifting means (24, 25) are arranged on the nozzle part (3), in front of and behind the suction channel (13) thereof, at an angle of inclination, which floats up outwards in the direction of the longitudinal sides of the nozzle part (3), in relation to the bearing plane (29) of the nozzle part (3).

7. Vacuum-cleaner nozzle according to Claim 6, characterized in that the operating edges (21, 22) bounding the suction channel (13) are continued at the same level in the region of the thread-lifting means (24, 25).

8. Vacuum-cleaner nozzle according to one or more of the preceding claims, characterized in that

arranged behind the rear operating edge (22) of the suction channel (13) is an elastic skirt (26) which extends at least over part of the length of the nozzle part (3).

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The invention relates to a vacuum-cleaner nozzle in the case of which a nozzle part (3), which has supporting rests (18, 19) in front of and behind its suction channel (13), is articulated in a tiltable manner on an intermediate channel part (2), in the region of one end of the latter, and, furthermore, a connector (4) for a suction line is arranged in a vertically pivotable manner on the intermediate channel part (3), in the region of the other end of the latter, and at least one supporting roller (9) is mounted in a rotatable manner on the housing of the intermediate channel part (2). Tilting of the nozzle part during vacuuming is avoided in that the pivot axis (7) of the connector (4) on the intermediate channel part (2) is located vertically above the axis of rotation (10) of the supporting roller (9), and in that the tilting axis (6) of the nozzle body (3) is located vertically beneath the axis of rotation (10) of the supporting roller (9) to the extent where the continuation (28) of the connecting line (27) between the pivot axis (7) and the tilting axis (6) intersects the bearing plane (29) of the nozzle part (3) in the region between the centre (20) of the front and rear supporting rests (18 and 19) and the bearing point (30) of the rear supporting rests (19) and is arranged horizontally in front of the rear supporting rests (19), in the direction of the centre (20) of the front and rear supporting rests (18 and 19).